



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Bryan David HAYNES

Serial No.: 10/036,853

Filing Date: 21 December 2001

Title: AIR MOMENTUM GAGE FOR CONTROLLING  
NONWOVEN PROCESSES

**RESPONSE TO NOTICE TO FILE MISSING PARTS OF APPLICATION**

**Box MISSING PARTS**

Assistant Commissioner for Patents  
Washington, D.C. 20231

Dear Sir:

In response to the Notice to File Missing Parts of Application mailed 05 February 2002, we have enclosed the items listed below.

- Executed combined Oath or Declaration, Power of Attorney and Petition (3 pages)

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I hereby certify that this correspondence (along with any paper referred to as being attached or enclosed) is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231 on

April 5, 2002

4/5/02  
Date

  
Signature

Serial No.: 10/036,853

- First Information Disclosure Statement, together with Form PTO-1449, 2 pages, and with copies of each and every cited reference
- Transmittal of Formal Drawings with three (3) sheets of drawings (Figs. 1-4)
- A check in the amount of \$954.00 for the filing fee and surcharge for late filing of the executed oath or declaration
- A copy of the Notice to File Missing Parts of Application
- Return Receipt Postcard

The Commissioner is hereby authorized to charge any deficiency or to credit any overpayment to Deposit Account No. 19-3550. A duplicate of this sheet is enclosed.

Respectfully submitted,



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Regis. No. 40,924

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In addition, the following rule has withheld the test of time: The rate of increase of the width,  $b$ , of the mixing zone with time is proportional to the transverse velocity  $v'$ :

$$\frac{Db}{Dt} \sim v'.$$

Here  $D/Dt$  denotes, as usual, the substantive derivative, so that  $D/Dt = u \frac{\partial}{\partial x} + v \frac{\partial}{\partial y}$ . According to a previous estimate, eqn. (19.6), we have  $v' \sim (D/Dt) v$ , and thus

$$\frac{Db}{Dt} \sim I \frac{\partial v}{\partial y}.$$

Further, the mean value of  $\partial v / \partial y$  taken over half the width of the jet may be assumed to be approximately proportional to  $u_{\infty} / b$ . Consequently,

$$\frac{Dv}{Dy} = \text{const} \times \frac{1}{b} u_{\infty} = \text{const} \times \beta u_{\infty}. \quad (24.7)$$

*Jet boundary:* With the use of the preceding relations we shall now estimate the rate at which the width of the mixing zone which accompanies a free jet boundary increases with the distance,  $z$ . For the jet boundary we have

$$\frac{Db}{Dt} \sim u_{\infty} \frac{\partial b}{\partial x}. \quad (24.8)$$

On comparing eqns. (24.8) and (24.7) we obtain

$$\frac{db}{dz} = \text{const} \times \frac{I}{b} = \text{const}.$$

or

$$b = \text{const} \times z$$

which means that the width of the mixing zone associated with a free jet boundary is proportional to the distance from the point where the two jets meet. The constant of integration which, strictly speaking, appears in the above equation can be made to vanish by a suitable choice of the origin of the coordinate system.

**Two-dimensional and circular jet:** Equation (24.8) remains valid in the case of a two-dimensional and of a circular jet,  $u_{\infty}$  denoting now the velocity at the centre line. Thus in such cases we also have

$$b = \text{const} \times z. \quad (24.9)$$

The relation between  $u_{\infty}$  and  $z$  can be obtained from the momentum equation. Since the pressure remains constant the integral of the  $x$ -component of momentum taken over the whole cross-sectional area must remain constant and independent of  $x$ , i. e.

$$J = \rho \int u \, dA = \text{const.} \quad \leftarrow$$



(3)



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APPLICATION NUMBER	FILING/RECEIPT DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NUMBER
10/036,853	12/21/2001	Bryan David Haynes	KCC-15,742

## CONFIRMATION NO. 4041

## FORMALITIES LETTER



\*OC000000007421578\*

Pauley Petersen Kinne & Erickson  
Suite 365  
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Hoffman Estates, IL 60195

Date Mailed: 02/05/2002

## NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

## FILED UNDER 37 CFR 1.53(b)

*Filing Date Granted*

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The statutory basic filing fee is missing.  
*Applicant must submit \$ 740 to complete the basic filing fee for a non-small entity. If appropriate, applicant may make a written assertion of entitlement to small entity status and pay the small entity filing fee (37 CFR 1.27).*
- Total additional claim fee(s) for this application is \$84.
  - \$84 for 1 independent claims over 3 .
- The oath or declaration is unsigned.
- To avoid abandonment, a late filing fee or oath or declaration surcharge as set forth in 37 CFR 1.16(l) of \$130 for a non-small entity, must be submitted with the missing items identified in this letter.
- **The balance due by applicant is \$ 954.**

04/10/2002 NM0HMM1 00000054 10036853

01 FC:101	740.00 0P
02 FC:102	84.00 0P
03 FC:105	130.00 0P

*A copy of this notice **MUST** be returned with the reply.*Ck. Charles Chantachai

Customer Service Center

Initial Patent Examination Division (703) 308-1202

PART 2 - COPY TO BE RETURNED WITH RESPONSE

*PCR*

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*Ch. Chom Keo Chantachanh*

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PART 3 - OFFICE COPY